

## **Amendements to the Specification**

Please delete paragraph [0090] of the published application (US 2002/0143599 A1). This corresponds to deleting the only paragraph on page 24 of the application as originally filed.

Please add the following paragraphs [0090] to [0107] after paragraph [0089] of the published application. This location corresponds to adding the following paragraphs after line 23 on page 23 of the application as originally filed. No new matter is added.

**[0090]** A method for long-range planning for a complex system comprises defining at least one resource description, wherein a resource description comprises a group of resources that have similar characteristics, and wherein defining comprises specifying the characteristics, including at least one capability and at least one performance measure; defining at least one work load; specifying at least one criteria to be satisfied by a long-range staffing plan; and calculating an effect of applying the at least one resource description to the at least one work load, wherein the calculated effect includes at least one performance measure for the at least one work load, and an effective cost per hour.

**[0091]** The complex system may be a contact center. The at least one resource description may include an employee profile. The at least one work load may include a queue. The at least one capability may include a skill set. The at least one performance measure may include an efficiency percentage. Applying the at least one resource description to the at least one work load may include staffing the at least one queue with

the at least one employee profile. The calculated effect may further include a queue occupancy for each queue, and an estimated cost of the long-range staffing plan.

**[0092]** The aforementioned calculating may comprise adding a first employee from the at least one profile to a proposed schedule, wherein there is an available work associated with each employee in the at least one profile, and wherein the proposed schedule is for servicing the at least one queue over a predefined time period; calculating an effect of adding the first employee, wherein adding an employee includes distributing the available work associated with the employee among the at least one queue; adding a next employee from the at least one profile to the proposed schedule; calculating an effect of adding the next employee taking into account the effect of having added the first employee; and iteratively adding additional employees to the proposed schedule and iteratively calculating effects of adding the additional employees taking into account each employee already added until the available work for every employee from the at least one profile has been distributed. The calculating the effect of adding the next employee may include redistributing available work among the at least one queue, and recalculating a workload remaining.

**[0093]** The aforementioned characteristics may further include: shrinkage, wherein shrinkage comprises various categories of time for which an employee is paid, but during which the employee does not work; burden, wherein burden comprises various categories of expenses associated with the employee, including benefit expenses; and wage. Specifying characteristics may further comprise specifying whether a profile may be hired into, and a time period required to bring an employee hired into the profile to a predefined level of efficiency.

**[0094]** The method for long-range planning for a complex system may further comprise displaying the calculated effect of the long-range staffing plan, comprising displaying for each queue of the at least one queue for each of a plurality of predefined time periods: a contact volume; a predefined average handling time goal; an actual service level; and a required service level. Displaying may further comprise displaying calculated effects of more than one staffing plan on a single display for comparison. The calculated effects of each of the more than one staffing plan may be arranged as rows and columns, and wherein displaying comprises placing corresponding rows from calculated effects of each of the more than one staffing plan in proximity to one another. The calculated effects of each of the more than one staffing plan may be arranged as rows and columns, and wherein displaying comprises placing corresponding columns from calculated effects of each of the more than one staffing plan in proximity to one another.

**[0095]** The estimated cost of the long-range staffing plan may include a training cost that reflects a period of time required for an employee to reach a predefined level of performance. The contact center may comprise multiple queues and multiple types of contact media, wherein the skill set includes skills across multiple queues and multiple contact media. Iteratively calculating effects of adding the additional employees taking into account each employee already added may include assigning additional employees across multiple queues and multiple contact media.

**[0096]** A system for long-range staffing planning in a contact center, wherein the multi-contact center processes a plurality of contact queues comprising a plurality of contact media, the system comprising: at least one server comprising at least one storage device; and at least one client processor coupled to the server through a network, wherein

the client processor is coupled to a plurality of storage devices, including a storage device that stores instructions that, when executed, cause the at least one client processor to, receive a definition of at least one employee profile, wherein an employee profile comprises a group of employees that have similar characteristics, wherein the characteristics include a skill set and an efficiency percentage; receive a definition of at least one queue, wherein the at least one queue handles a plurality of contacts through a plurality of contact media; receiving a specification of at least one criteria to be satisfied by a long-range staffing plan; and calculating an effect of staffing the at least one queue with the at least one employee profile, wherein the calculated effect includes a service level for the at least one queue, and an effective cost per hour.

**[0097]** The calculated effect may further include a queue occupancy for each queue, and an estimated cost of the long-range staffing plan. Calculating may comprise adding a first employee from the at least one profile to a proposed schedule, wherein there is an available work associated with each employee in the at least one profile, and wherein the proposed schedule is for servicing the at least one queue over a predefined time period; calculating an effect of adding the first employee, wherein adding an employee includes distributing the available work associated with the employee among the at least one queue; adding a next employee from the at least one profile to the proposed schedule; calculating an effect of adding the next employee taking into account the effect of having added the first employee; and iteratively adding additional employees to the proposed schedule and iteratively calculating effects of adding the additional employees taking into account each employee already added until the available work for every employee from the at least one profile has been distributed.

**[0098]** Calculating the effect of adding the next employee may include redistributing available work among the at least one queue, and recalculating a workload remaining. The characteristics may further include: shrinkage, wherein shrinkage comprises various categories of time for which an employee is paid, but during which the employee does not work; burden, wherein burden comprises various categories of expenses associated with the employee, including benefit expenses; and wage. The characteristics may further include whether a profile may be hired into, and a time period required to bring an employee hired into the profile to a predefined level of efficiency.

**[0099]** The instructions, when executed, may further cause the at least one client processor to display the calculated effect of the long-range staffing plan, comprising displaying for each queue of the at least one queue for each of a plurality of predefined time periods: a contact volume; a predefined average handling time goal; an actual service level; and a required service level. The system for long-range staffing planning in a contact center may further display calculated effects of more than one staffing plan on a single display for comparison as specified by a user.

**[00100]** The calculated effects of each of the more than one staffing plan may be arranged as rows and columns and, in response to the user specification, corresponding rows from calculated effects of each of the more than one staffing plan are displayed in proximity to one another. The calculated effects of each of the more than one staffing plan may be arranged as rows and columns, and, in response to the user specification, corresponding columns from calculated effects of each of the more than one staffing plan may be displayed in proximity to one another. The estimated cost of the long-range

staffing plan may include a training cost that reflects a period of time required for an employee to reach a predefined level of performance.

**[00101]** Iteratively calculating effects of adding the additional employees taking into account each employee already added may include assigning additional employees across multiple queues and multiple contact media. The storage device that stores the instructions may be accessed by the at least one processor through the network. The storage device that stores the instructions may be the at least one storage device of the server.

**[00102]** An electromagnetic medium containing executable instructions which, when executed in a processing system, cause the system to generate effects of a proposed long-range staffing plan for a contact center, wherein generating comprises: defining at least one employee profile, wherein an employee profile comprises a group of employees that have the same skills, and wherein defining comprises specifying characteristics, including a skill set and an efficiency percentage; defining at least one queue; specifying at least one criteria to be satisfied by a long-range staffing plan; and calculating an effect of staffing the at least one queue with the at least one employee profile, wherein the calculated effect includes a service level for the at least one queue, and an effective cost per hour.

**[00103]** The calculated effect may further include a queue occupancy for each queue, and an estimated cost of the long-range staffing plan. Calculating may comprise adding a first employee from the at least one profile to a proposed schedule, wherein there is an available work associated with each employee in the at least one profile, and wherein the proposed schedule is for servicing the at least one queue over a predefined

time period; calculating an effect of adding the first employee, wherein adding an employee includes distributing the available work associated with the employee among the at least one queue; adding a next employee from the at least one profile to the proposed schedule; calculating an effect of adding the next employee taking into account the effect of having added the first employee; and iteratively adding additional employees to the proposed schedule and iteratively calculating effects of adding the additional employees taking into account each employee already added until the available work for every employee from the at least one profile has been distributed.

**[00104]** Calculating the effect of adding the next employee may include redistributing available work among the at least one queue, and recalculating a workload remaining. The characteristics may further include: shrinkage, wherein shrinkage comprises various categories of time for which an employee is paid, but during which the employee does not work; burden, wherein burden comprises various categories of expenses associated with the employee, including benefit expenses; and wage. Specifying characteristics may further comprise specifying whether a profile may be hired into, and a time period required to bring an employee hired into the profile to a predefined level of efficiency.

**[00105]** The electromagnetic medium may contain further executable instructions which, when executed in a processing system, may cause the system to display the calculated effect of the long-rang staffing plan, comprising displaying for each queue of the at least one queue for each of a plurality of predefined time periods: a contact volume; a predefined average handling time goal; an actual service level; and a required service level. Displaying may further comprise displaying calculated effects of more

than one staffing plan on a single display for comparison. The calculated effects of each of the more than one staffing plan may be arranged as rows and columns, and wherein displaying comprises placing corresponding rows from calculated effects of each of the more than one staffing plan in proximity to one another. The calculated effects of each of the more than one staffing plan may be arranged as rows and columns, and wherein displaying may comprise placing corresponding columns from calculated effects of each of the more than one staffing plan in proximity to one another.

**[00106]** The estimated cost of the long-range staffing plan may include a training cost that reflects a period of time required for an employee to reach a predefined level of performance. The contact center may comprise multiple queues and multiple types of contact media, wherein the skill set includes skills across multiple queues and multiple contact media. Iteratively calculating effects of adding the additional employees taking into account each employee already added may include assigning additional employees across multiple queues and multiple contact media.

**[00107]** A method and apparatus for long-range planning have been described with reference to particular embodiments and examples. Various modifications in approach and application are possible without departing from the spirit and scope of the invention, which is defined by the following claims.